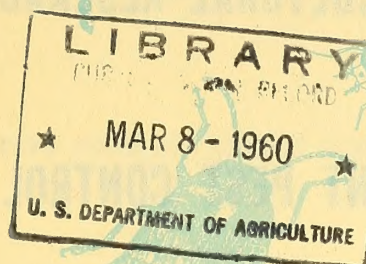


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Cooperative **ECONOMIC INSECT REPORT**

Issued by

PLANT PEST CONTROL DIVISION

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearinghouse and does not assume responsibility for accuracy of the material.

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Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

Several species of BARK BEETLES causing top and complete kill of ponderosa pines in areas of California (p. 117) and BLACK TURPENTINE BEETLE activity has increased in areas of Florida (p. 118).

Number of KHAPRA BEETLE-infested properties in California reported in CEIR 10(7):87, should be corrected to 340. (p. 120).

INSECT DETECTION: Mexican fruit fly trapped for the first time in Starr County, Texas. (p. 116). Imported fire ant found for the first time in Pamlico County, North Carolina, during January. (p. 120). Second specimen of an ichneumonid (Carinodes havanensis) collected in Dade County, Florida. (p. 120).

CORRECTIONS. (p. 120).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1959

Cotton Insects - (p. 121).

WEATHER OF THE WEEK ENDING FEBRUARY 22

Temperatures in most sections of the Nation averaged below normal this week. Near normal readings were reported, however, along the Pacific coast, and unusually mild weather was experienced from the upper Great Lakes to New England on several days. Weekly averages were 6° to 12° above normal throughout New England and northern New York and in the upper Great Lakes. Cold arctic air covered the northern Great Plains most of the week, and unusually cool temperatures persisted across much of the southern half of the Nation. Weekly averages were 9° to 12° below normal over the central Great Plains from eastern Colorado to South Dakota and Iowa, in the Kentucky-Tennessee area, and from eastern Oklahoma and Texas eastward to Georgia and central Florida. Louisiana reported the coldest week of the winter there. Below-zero temperatures were general as far south as southern Nebraska and Iowa late in the week, reaching below -20° in areas of the Dakotas on Friday morning. Below-zero readings were also recorded as far south as eastern Kentucky in the Appalachians. Frost and freezing temperatures extended as far south as Arizona, southwestern Texas, and scattered areas of the Everglades in Florida. In Florida no significant damage to crops was attributed to freezes early and again late in the week.

Precipitation was generally light west of the Rocky Mountains, except in coastal sections from northern California northward, and local areas in the Sierras. Scattered snow over the northern Great Plains and upper Great Lakes was locally moderate to heavy as a low-pressure area moved eastward on Tuesday and Wednesday, but water equivalents were generally below 0.50 inch.

The major precipitation-producing storm of the week developed in Texas on Wednesday, moved eastward along the Gulf coast to Mississippi, then northeastward to New England by early Saturday. Strong winds and heavy rain or snow accompanied the storm throughout its journey. Precipitation totals were generally 1 to 2 inches. Snow was reported as far south as central Mississippi and Georgia, and was unusually heavy over an area from the Cumberland Plateau in Tennessee and Kentucky northeastward to central Maine. From 10 to 15 inches of snow were reported in Tennessee and Kentucky, up to 22 inches in West Virginia and western New York, and 20 inches in southwestern and central Maine. Severe, drifting snow blocked highways in Pennsylvania and New York. Moderate to heavy rain extended from Louisiana and northwestern Florida through the Atlantic Coastal States to southern New England. Precipitation again covered the mid-section of the Nation over the weekend, following the passage of a low-pressure area from the Pacific coast through western Texas, Oklahoma, and Missouri to the lower Great Lakes. In the central Great Plains and middle Mississippi Valley locally heavy snow was accompanied by strong winds and followed by much colder temperatures, while heavy rains fell in the central Gulf States. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GREENBUG (Toxoptera graminum) - OKLAHOMA - Populations have decreased during past few weeks in most infested fields of small grain checked in Kingfisher, Logan, Payne, Pawnee and Noble Counties; however, counts have increased considerably in one Payne County field checked and now average 100 per linear foot, with winged forms common. (VanCleave, Stiles). Counts averaged 0.5, 1.0 and 10 per linear foot in 3 fields of wheat checked in Kingfisher and Garfield Counties (Owens), ranged 2-6 per linear foot in 2 fields of wheat in Blaine County and none were found in 2 fields in Custer County (Hudson). None noted in 4 fields of small grain in Tillman County. (Hatfield). Populations increasing and becoming more common in south central area; counts ranged 4-80 per linear foot (averaged 23 per linear foot) in 6 fields checked in Bryan, Johnston and Marshall Counties; and none were noted in another field checked in Bryan County (Vinson).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Averaged 100 per linear foot in a limited area of one field of wheat checked in Pawnee County and none were noted in other fields of small grain checked in Payne, Noble, Logan and Kingfisher Counties. (VanCleave, Stiles). Averaged 5 per linear foot in a Kingfisher County field of wheat and none were found in 2 other fields checked in Kingfisher and Garfield Counties. (Owens). None were noted in 4 Tillman County fields checked (Hatfield) and counts averaged 2, 15 and 20 per linear foot in 3 fields of wheat in Marshall County, with none noted in 4 other fields checked in the south central area (Vinson).

CORN LEAF APHID (Rhopalosiphum maidis) - OKLAHOMA - Averaged 3 per linear foot in 2 fields of oats checked in Bryan and Marshall Counties, with none being noted in 5 other fields of small grain checked in south central area. (Vinson).

ENGLISH GRAIN APHID (Macrosiphum granarium) - OKLAHOMA - Populations averaged 6 per linear foot in a field of wheat checked in Marshall County. None were noted in 6 other fields checked in the south central area. (Vinson).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - In 2 fields of wheat checked in Payne and Noble Counties, counts averaged 3 and 25 per linear foot, respectively. (VanCleave, Stiles).

SPOTTED ALFALFA APHID (Therioaphis maculata) - NEW MEXICO - Populations building up in several fields of alfalfa in Eddy and Chaves Counties. Many growers preparing to apply controls as soon as weather is warmer. (N. M. Coop. Rpt.). OKLAHOMA - Averaged 0, 3 and 20 per linear foot in 3 fields of alfalfa checked in Kingfisher, Payne and Garfield Counties, respectively (Owens); 8, 17 and 32 per linear foot in 3 fields of alfalfa in Tillman County (Hatfield); and 16 per square foot in a field of alfalfa in Johnston County (Vinson). Counts ranged 1-5 per linear foot in a field of alfalfa checked in Murray County. (Meharg).

PEA APHID (Macrosiphum pisi) - NEW MEXICO - Light to moderately heavy infestations present in Chaves, Eddy and Lea Counties. (N. M. Coop. Rpt.). OKLAHOMA - Counts averaged 0, 3 and 5 per linear foot in 3 fields of alfalfa checked in Kingfisher, Garfield and Payne Counties, respectively (Owens); averaged 12 per square foot in a Johnston County field of alfalfa checked (Vinson); and ranged 3-6 per linear foot in a Murray County field checked (Meharg). ARIZONA - Light to medium infestations present in central and southwest area alfalfa. (Ariz. Coop. Sur.).

A CRANE FLY (Tipula sp.) - CALIFORNIA - Heavy in lawns and grassy areas in San Luis Obispo, San Luis Obispo County. (Cal. Coop. Rpt.).

FRUIT INSECTS

Citrus Insect Situation in Florida - Mid-February - PURPLE SCALE (Lepidosaphes beckii) is holding in the low range and will continue low during the next month. A few moderate infestations have been seen in the Indian River and Ridge districts. Cold weather has caused FLORIDA RED SCALE (Chrysomphalus aonidum) activity to decrease to a low level. It will remain below average for several weeks. Moderate activity is present in the Ridge and Indian River districts. CITRUS RED MITE (Panonychus citri) activity has shown little change in February. An upward trend is expected soon which will continue through March. Although population over the State is low, all districts have a few groves with moderate to heavy infestations. Highest activity is in the upper east coast and Brooksville districts. Activity of CITRUS RUST MITE (Phyllocoptruta oleivora) reached the high range during the past 2 weeks. It is expected to continue above average during February and trend downward in March. Infestations on both leaves and fruit are presently much higher than normal for this time of year. Highest activity is in the Bartow, west coast, Indian River and Ridge districts. (Simanton, Thompson, Johnson (Citrus Exp. Sta., Lake Alfred)).

CITRUS BLACKFLY (Aleurocanthus woglumi) - MEXICO - Surveys were conducted in the chemical control and free zones in the States of Tamaulipas, Nuevo Leon, Sonora and Baja California during January, with a total of 70,337 citrus trees being inspected on 3,768 properties. Thirteen trees were found lightly infested on 8 properties. The infested properties are located as follows: 3 with 4 infested trees in Municipio Allende, Nuevo Leon; 4 with 6 infested trees in Municipio Hidalgo, Tamaulipas; and one with 3 infested trees in Hermosillo, Sonora. The infested trees in Allende and Hidalgo were handpicked of infested leaves and placed under observation. On January 31, a rather heavy infestation was found near Allende, Nuevo Leon. A delimiting survey was begun. In the Matamoros district, adjacent to the lower Rio Grande Valley of Texas, inspections were made of 34,530 citrus trees on 2,722 properties, with negative results. Results of inspections made in Tijuana, Baja California, also were negative. Spot checks in the biological control zone in Tamaulipas indicated good general control by parasites. Within the Victoria zone of Tamaulipas, releases of a parasite (Prospaltella opulenta) by municipio were as follows: Guemez - 36,400; Hidalgo - 6,100; Padilla - 12,500; Victoria - 79,700. Application of insecticides continued in Nuevo Leon. (PPC, Mex. Reg., Jan. Rpt.).

MEXICAN FRUIT FLY (Anastrepha ludens) - TEXAS - One adult male trapped in Starr County on January 22. This is the first find of this species in that county, which is outside the regulated area. In addition to the Starr County collection, A. ludens was trapped as follows: 8 in Hidalgo County, 6 males and 2 females; 2 in Cameron County, 1 male and 1 gravid female; and 1 male in Willacy County. Traps were also placed in operation during January in La Salle, Zavala and Frio Counties. As of the end of January, a total of 16 adults have been trapped during the 1959-60 season in Texas. Grove inspections for possible larval infestations in those properties where gravid females were trapped have been negative.

OYSTERSHELL SCALE (Lepidosaphes ulmi) - CALIFORNIA - Heavy populations occurred on apple trees on a property in Eureka, Humboldt County. (Cal. Coop. Rpt.).

AN APHID (Thoracaphis umbellulariae) - CALIFORNIA - Light population present on olive in Nipomo, San Luis Obispo County. (Cal. Coop. Rpt.).

TRUCK CROP INSECTS

CABBAGE LOOPER (Trichoplusia ni) - TEXAS - Continues to be of concern on lettuce and cabbage in the lower Rio Grande Valley. (Deer).

DIAMONDBACK MOTH (Plutella maculipennis) - GEORGIA - Light infestations present on cabbage in Colquitt, Lowndes and Brooks Counties. (Johnson).

CABBAGE APHID (Brevicoryne brassicae) - GEORGIA - Infestations on cabbage are light in Colquitt, Lowndes and Brooks Counties. (Johnson).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Infestations are still very light on lettuce in all areas. Sticky-board collections during the period February 8-15 were 3 at Mesa, 2 at Kyrene, 1 at Waddell, 9 at Glendale and 3 at Deer Valley. (Ariz. Coop. Sur.).

ONION THRIPS (Thrips tabaci) - TEXAS - Light infestations continue to cause damage to onions in the lower Rio Grande Valley. (Deer).

CORN LEAF APHID (Rhopalosiphum maidis) - ARIZONA - Light infestations on potatoes in Yuma County. A majority of individuals are winged forms. (Ariz. Coop. Sur.).

SWEETPOTATO WEEVIL (Cylas formicarius elegantulus) - ALABAMA - New infestations found in Coffee County, which was released from regulation several years ago, and in Houston and Mobile Counties. GEORGIA - New infestations found in Brooks, Cook and Ware Counties. MISSISSIPPI - New infestations found in Greene, Covington and Forrest Counties. LOUISIANA - Total of 28 new infestations found in 8 parishes. (PPC, So. Reg., Jan. Rpt.)

A SPIDER MITE (Tetranychus cinnabarinus) - ARIZONA - Medium infestations in some fields of sugar beets in the central area of the State. (Ariz. Coop. Sur.).

A LEAF MINER (Phytomyza sp.) - CALIFORNIA - A medium infestation, possibly P. atricornis, present on artichoke in the Santa Cruz area of Santa Cruz County. (Cal. Coop. Rpt.).

A STRAWBERRY APHID - CALIFORNIA - An infestation of what is probably Pentatrichopus fragaefolii is severe on 40 acres of strawberries in Downey, Los Angeles County. (Los Angeles Co. Farm Advisor).

TOBACCO INSECTS

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - GEORGIA - Infestations on tobacco in the plant bed are light in Tift, Berrien, Lanier, Cook, Colquitt, Lowndes and Brooks Counties. (Johnson).

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light infestations present on tobacco in the plant bed in 7 tobacco-raising counties. (Johnson).

SPRINGTAILS - GEORGIA - Infestations on tobacco plant beds are light to moderate in Cook and Colquitt Counties. (Johnson).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

BARK BEETLES - CALIFORNIA - Dendroctonus brevicomis, D. monticolae and Ips spp. causing complete kill of ponderosa pine in small groups in the Omo Ranch-Somerset-Fairplay area on private land in El Dorado County. (G. C. Hill, W. O. Cotter). Also caused complete kill of 32 large ponderosa pines in one group 12 miles east of Placerville; many scattered trees showing flagging, windthrows and fire damage in fall of 1959 probably responsible. (Van Johnson). These three beetles causing top and complete kill of ponderosa pines in small groups in a 160-acre area in the Big Creek area and in 5,000 acres of mixed ownership in the Westfall-Miami districts. Treatment of infested trees contemplated. (D. Flohr, L.E. Ballew).

BLACK TURPENTINE BEETLE (Dendroctonus terebrans) - FLORIDA - Activity increased markedly in January after high water receded. Trees so weakened by flooding and beetle attacks on many acres that considerable mortality has already occurred. Salvage and sanitation logging have been recommended in those areas where operable cut can be made and where logging conditions are not difficult because of mud and water in Hernando and Pasco Counties. (V.F. McCowan).

A REPRODUCTION WEEVIL (Cylindrocopturus eatoni) - CALIFORNIA - Causing complete kill of 5 to 6-year-old ponderosa pine seedlings in the 4,400-acre Allen Ranch Burn Plantation in El Dorado County, near Georgetown. Damage mostly confined to porcupine-damaged and suppressed trees. Drought conditions during the year severe in this area. (D. W. Jones).

GYPSY MOTH (Porthetria dispar) - NEW YORK - Scouting of positive trap sites in upstate New York has continued during January. No infestations were located within the eradication areas in that portion of the State. In the central area, only one small infestation in Deerfield Township was reported. In Otsego County, small infestations were located in 6 townships, one of these being in Morris Township within 3 miles of the quarantine line. Observations in Otsego County indicate existence of a sprinkling of infestation in the Cherry Valley section and a somewhat similar condition, although limited in extent, to the southwest of Otsego Township. In Herkimer County, infestations were located around trap sites in 5 townships. Continued checking of infestations in the Capital region revealed 2 areas of heavy populations in Schenectady County, one containing 1,000 egg masses per acre over 15 acres and the other containing 2,000 egg masses per acre over 20 acres. NEW JERSEY - No egg masses were found in surveys of Morristown National Park, Montague-Minisink Island area, Lewis Morris Park, Morristown and a section of Parvin State Park at Bridgeton during January. PENNSYLVANIA - Scouting in Perry County was negative. VERMONT - No large areas of infestation observed in northwestern area, but light infestations were found at places where no infestation had been observed in several years, indicating that there may be some heavily infested areas not yet located. CONNECTICUT - In the vicinity of Middlebury and Oxford, an infestation that involved more than 2,000 acres in 1959 and had an egg count of less than 50 per acre, now has an egg count of several thousand per acre. Heavy defoliation is indicated unless the area is treated. At Wallington, a 30-acre stand of woodland was found to have between 800 and 1,000 egg clusters per acre, while at Meriden a 5-acre stand has 50 to 100 clusters per acre. Egg clusters ran between 800 and 1,000 per acre on several hundred acres in the vicinity of Durham, Higganum and Middletown. (PPC, East. Reg., Jan. Rpt.). INDIANA - Surveys for egg masses on 13 properties and in Johnny Appleseed Park, Allen County, were negative. (PPC, Cent. Reg., Jan. Rpt.).

EASTERN TENT CATERPILLAR (Malacosoma americanum) - FLORIDA - Collected on wild plum (Prunus sp.) at Gainesville, Alachua County, on February 8. Collected and determined by L. A. Hetrick. Egg mass hatching as of this date. Very few egg masses present this year. (Fla. Coop. Sur.).

A SYCAMORE BORER (Ramosia resplendens) - CALIFORNIA - Heavy infestation in sycamore in Escondido, San Diego County. (Cal. Coop. Rpt.).

TOBACCO BUDWORM (Heliothis virescens) - CALIFORNIA - Damaging geraniums in Dos Palos, Merced County. (Cal. Coop. Rpt.).

APHIDS - NEW MEXICO - Populations of Cinara tujafilina are building up rapidly in southern counties on arborvitae. (N. M. Coop. Rpt.). OKLAHOMA - Light to medium infestations of several species noted on a variety of plants in 2 greenhouses checked in the north central area of the State. (Stiles, VanCleave, Young).

SCALE INSECTS - CALIFORNIA - Medium infestations of Odonaspis ruthae present on Bermuda grass in Sacramento, Sacramento County, and infestations of Aspidiotus lataniae are heavy on black walnut in Santa Paula, Ventura County, and on pyracantha in Rancho Santa Fe, San Diego County. (Cal. Coop. Rpt.).

A BOSTRICHID (Dinoderus minutus) - CALIFORNIA - Heavy infestation present in bamboo stalks in Concord, Contra Costa County. (Cal. Coop. Rpt.).

AN ORIBATID MITE - CALIFORNIA - Heavy infestations of an undetermined species occurring on cymbidium plants on a property in Santa Barbara, Santa Barbara County. (Cal. Coop. Rpt.).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE GRUBS (Hypoderma spp.) - NEW MEXICO - The number of H. lineatum grubs per animal in untreated cattle in 6 herds checked during December 1959 and January 1960 averaged 30.4 and 12.3 in 2 herds in Union County, 13.9 and 19.5 in 2 San Miguel County herds, and 9.7 and 9.1, respectively, in one herd each in Harding and Dona Ana Counties. (N. M. Coop. Rpt.). UTAH - Present in backs of untreated cattle in the Ephraim-Chester area of Sanpete County and have been troublesome for several weeks in warmer parts of Washington County. (Knowlton). OKLAHOMA - H. lineatum counts ranged 3-10 per animal on 8 beef cattle checked in Johnston County. (Vinson).

CATTLE LICE - UTAH - Moderate to severe on herds in Washington County (Knowlton, Hughes); common on cattle throughout Beaver County, being severe in some herds (Knowlton, Esplin); and common on untreated cattle in the Ephraim-Chester area of Sanpete County (Knowlton). OKLAHOMA - Heavy on a bull and a few cows checked in a herd of beef cattle in Johnston County. (Vinson).

LONE STAR TICK (Amblyomma americanum) - OKLAHOMA - Counts averaged 9 per animal on 62 beef cows and 12 per animal on 16 yearling calves checked in Pushmataha County. (Goin).

STORED-PRODUCT INSECTS

KHAPRA BEETLE (Trogoderma granarium) - MEXICO - Inspections in Baja California, Sonora, Jalisco and Chihuahua during January were negative. No infestations have been found in the country since a collection was confirmed in May 1959 from Baja California. TEXAS - A reinfestation was found in the Union Stock Yards at El Paso in early January. The buildings were fumigated during the month. States in the United States where negative inspections were made during January were as follows: Alabama, Arkansas, Colorado, Connecticut, Florida, Idaho, Maryland, Massachusetts, Mississippi, New Mexico, New York, North Dakota, Oklahoma, Oregon, Pennsylvania, Tennessee, Washington and Wyoming. (PPC).

Stored-product Insects in New Mexico - A CARPET BEETLE (Attagenus sp.) and DARK MEALWORM (Tenebrio obscurus) were found to be abundant on feed sacks at several farms in Hidalgo and Grant Counties. (N. M. Coop. Rpt.).

ANGOUMOIS GRAIN MOTH (Sitotroga cerealella) - TEXAS - Light infestations were observed in stored rice in Liberty County. (Turney).

LESSER MEALWORM (Alphitobius diaperinus) - MARYLAND - Adults abundant in litter of a brooderhouse at Mt. Vernon, Somerset County. (U. Md., Ent. Dept.).

BENEFICIAL INSECTS

HYMENOPTEROUS PARASITES - OKLAHOMA - Counts averaged 0.02, 0.02 and 0.05 per linear foot in 3 fields of small grain checked in Johnston and Marshall Counties. (Vinson).

CONVERGENT LADY BEETLE (Hippodamia convergens) - OKLAHOMA - Very limited numbers present in alfalfa and small grain fields in Kingfisher, Garfield and Payne Counties. (Owens). An occasional adult noted in a few alfalfa fields checked in Tillman County. (Hatfield).

MISCELLANEOUS INSECTS

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - NORTH CAROLINA - Found for the first time in Pamlico County during January. (PPC, So. Reg.).

AN ICHNEUMONID (Carinodes havanensis) - FLORIDA - Collected at Miami, Dade County, in combination dry trap in calamondin tree (Citrus mitis), November 17, 1959. (C. M. Grannis, D. H. Alexander). This is the second specimen in the State Plant Board collection; the other is from Lake Worth. (Fla. Coop. Sur.).

TERMITES - UTAH - Damaging many homes in Washington County. Subterranean termites are involved in most cases. (Knowlton).

BROWN SPIDER BEETLE (Ptinus clavipes) - CALIFORNIA - Medium infestation present in a house in Mira Loma, Riverside County. (Cal. Coop. Rpt.).

CORRECTIONS

CEIR 9(40):903 - Note on EUROPEAN FRUIT SCALE (Aspidiotus ostreaeformis) should be deleted, as it involves a misidentification. The species should be Aspidaspis arctostaphyli. No new State record is involved.

CEIR 10(7):87 - KHAPRA BEETLE line three should read: "... , 340 properties in California,..."

LIGHT TRAP COLLECTIONS

	<u>Pseudaletia</u> <u>unipuncta</u>	<u>Feltia</u> <u>subterr.</u>	<u>Prodenia</u> <u>ornith.</u>	<u>Agrotis</u> <u>ipson</u>	<u>Peridroma</u> <u>margaritosa</u>
ARIZONA					
Mesa 2/8-14			5		1
SOUTH CAROLINA					
Charleston 2/15-21	2	2	1	3	
FLORIDA					
Gainesville 2/16		3			
Homestead 2/12		4			
Monticello 2/11		3			

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES ^{1/}

1959

COTTON INSECTS

Several pests were important on cotton during 1959. Those reported as causing heavy damage in certain areas were bollworms, boll weevil, beet armyworm, cotton leaf perforator, salt-marsh caterpillar, cotton square borer, cutworms, lygus bugs, thrips and spider mites. Only bollworms, and to some extent boll weevil, appeared to cause widespread damage, however.

BOLL WEEVIL (Anthonomus grandis) infestations were reported heavy during the season in Georgia, Virginia and in Texas, while those in Oklahoma were considered higher than in 1958. In Virginia, the insect became a serious problem during late July and August and reduced yields to a varying extent. Infestations in Georgia were very heavy in the southern portion of the State but were more moderate in middle and northern portions. Frequently, rains in late May and early June in this State prevented many farmers from applying controls on schedule. Infestations in Texas built up considerably late in the season. Areas heaviest hit in Oklahoma were the southeast and east central. Highest infestations were in the southwest counties, the major cotton-producing area of the State.

Boll weevil infestations in Arkansas were somewhat more general than in 1958 from the standpoint of seasonal development; however, cotton in 1959 was about two weeks earlier than in 1958. Low rainfall in late June and early July helped hold down infestations. In the hill section and the upper Arkansas River Valley areas of Arkansas, infestations were heavy throughout the season, but maximum production was obtained by proper treatments. The percent of punctured squares during the last week of July, August and the first week of September (weekly averages) was 8, 10, 15, 19, 24, 29 and 24, compared with 6, 9, 11, 14, 17 and 22 for the same weeks in 1958.

Light boll weevil infestations were found during May in Tensas Parish, Louisiana, and in June in East Baton Rouge Parish, Louisiana. First-generation weevils appeared in southern Louisiana in mid-June and in the north by July 1. Some treatments were being made by the third week of June. Heavy emergence of third-generation weevils were observed about mid-August in Louisiana. In Mississippi, the percent of squares infested by boll weevil for the weeks ending June 27, July 4 and July 11 was 17, 16 and 14, respectively, and infestations ranging above 50 percent were fairly common in some areas by the end of July. A heavy egg deposition by second-generation weevils was also observed during late July.

No boll weevils survived the winter in hibernation cages in Missouri, nor were any live weevils recovered from ground trash collected during the early spring. Punctured squares were first detected in Missouri the last week in July. Number of weevils increased rapidly during late August and September in that State. Due to the early maturity of the crop, however, very little loss of the top crop occurred.

Infestations of boll weevil began appearing in cotton fields of southeastern Oklahoma early in June. By late June, counts in some fields in that section averaged as high as 30 percent punctured squares. Similar counts were reported in the east central and south central areas by mid-July. Surveys for the boll weevil in Nevada during 1959 were negative.

Collections of surface trash samples (two square yards per sample for hibernating boll weevils) were made in eight states during the fall of 1959. Counts appeared to be generally higher in all states sampled, except Georgia. Of special interest

^{1/} Including all reporting states except Hawaii and Alaska, which were carried in CEIR 10(4):46 and CEIR 10(6):74, respectively.

in this regard were the surveys in Missouri, where hibernating weevils were recovered from ground trash for the first time in northern Dunklin, Stoddard and Butler Counties. The highest recovery was 6,292 weevils per acre in northern Dunklin County. Details of these surveys can be found in CEIR 9(52):1061; 10(1):4; 10(3):26; and 10(5)54. The averages per acre based on area or district surveyed are tabulated below.

Fall Surface Trash Examinations for Hibernating Boll Weevils

State	Area or District	Number of Live Weevils Per Acre	
		1958	1959
Georgia	Northwest	774	145
	North central	2,178	1,186
	East central	387	823
	South	145	242
Louisiana	Northeastern	5,786	8,097
Mississippi	Lower delta	4,242	4,215
	Central delta	4,909	8,513
	North delta	2,960	4,787
	Hill section	3,057	2,991
Missouri	Dunklin, Scott, Butler Counties		1,283
North and South Carolina	South central section of South Carolina	995	1,318
	Coastal plains of North Carolina and South Carolina	4,625	5,082
	Piedmont section of North Carolina and South Carolina	2,635	4,383
	North central North Carolina	968	834
Tennessee	McNairy County	1,214	1,882
Texas	Central		6,631

FLEA BEETLES (*Systema* spp.) heavily infested bracts of squares in Yuma County, Arizona, in early July, and PALE-STRIPED FLEA BEETLE (*S. blanda*) was heavy in cotton fields in Clark County, Nevada, during the same month. Infestations in Nevada caused light to moderate damage. The fruit was not noticeably damaged in Arizona, however. Pale-striped flea beetle became very numerous in scattered cotton fields in Missouri, but feeding was largely confined to the cotyledons and control was not necessary. In Arkansas, *S. frontalis* was found throughout the season in research plots at Kelso, where scars from feeding on leaves, bracts and bolls were noticeable, but damage was not economic even though numbers were heavy in some fields.

BEETLES of the genus *Colaspis* appeared in numbers in cotton fields in Arkansas during the summer and fed fairly heavily in most instances on cotton in that State. They also began moving into cotton fields in Missouri during late June and early July, feeding on the square bracts and on the leaves. Some treatments were applied in Missouri, but it is doubtful if control efforts returned the application costs. Infestations in Arkansas were noneconomic and disappeared in July.

BLISTER BEETLES damaged cotton in local areas within the fields in Lea County, New Mexico, and a WEEVIL (Anthonomus sp.) was light along edges of a few Pinal County cotton fields during November.

BOLLWORMS (Heliothis spp., et al.) were major pests of cotton during the 1959 season in several areas. Infestations in Georgia ranged light to heavy, but were mostly light to moderate. In Virginia, bollworms were a serious problem during July and August, reducing yields to varying extent. Bollworms first appeared in late May in Georgia, an early appearance date.

Bollworms reached two peaks in Missouri; the first occurred in early July when about 45 percent of the scouted fields were infested and the second occurred about mid-August. Only a few infested fields required control during the first peak. The second infestation of bollworms occurred throughout all cotton-growing counties in Missouri and damage and loss ranged from 16 to 22 percent in untreated fields, compared with 2 to 7 percent in treated fields. At the peak of the second infestation, control was rather difficult to obtain with any and all of the chlorinated hydrocarbons. Subsequent investigation showed this to be a combination of factors, with no actual resistance being found. Predators and parasites were below normal this season in Missouri, although a fungus disease became very common during the latter part of the outbreak.

Infestations of H. zea and H. virescens in Arkansas were somewhat comparable to those of 1958 except for the heavier early infestations in 1959. Beneficial insects cleaned up early infestations, however. Bollworms remained under control of beneficials until late July in Arkansas when a breakthrough occurred in some fields due to a high percent of egg hatch during a period of high humidity and scarcity of predators. In Louisiana, a few eggs and small larvae were noted in Madison Parish during mid-June. Infestations remained general and light in Louisiana until the middle of August at which time egg deposition began to increase. By the end of August, egg deposition by bollworms had become quite heavy. Treatments kept larval populations under control. Bollworms were generally moderate in Mississippi.

Bollworms continued to cause damage throughout Oklahoma and caused heavy damage throughout the cotton-growing areas of Texas. Overall damage in Oklahoma was probably slightly less than recorded in 1958 but some untreated fields in central Oklahoma suffered extensive damage.

Bollworms were generally light to moderate in the cotton area of New Mexico, with occasional heavy infestations requiring treatments. Several times there were buildups almost to the point where controls were needed, but rain, predators or other factors made controls unnecessary. In Arizona, counts of bollworms were 4 to 6 per 100 terminals in Yuma County during mid-June and caused considerable damage to the squares. These infestations in Yuma County were brought under control by early July treatments and by predators. Infestations in the central and southeastern areas of Arizona were spotty and generally light, although occasional fields suffered considerable damage.

Infestations of bollworms in Nye County, Nevada, were the heaviest since the inauguration of cotton as a crop in the area. The number of infested bolls was three times greater than the previous high.

PINK BOLLWORM (Pectinophora gossypiella) infestations were generally more common in Oklahoma, but considerably lighter than those reported during 1958. Infestations in Texas were not a problem during 1959, but heavy infestations developed in the southwestern corner of Dona Ana County, New Mexico, during August, September and October. The first pink bollworm larvae were collected from rosette blooms in southwestern Dona Ana County during the latter part of June.

In Arizona, approximately 75,000 acres of cotton were treated beginning at the appearance of squares as part of the cooperative program to eradicate this pest from the central area of the State. Most acreage found infested during 1959 was light. A summary of the 1959 infestations in Arizona is tabulated below.

Pink Bollworm Infestations in the 1959 Arizona Cotton Crop

County	Number of Localities	Number of Properties	Number of Acres
Central Area			
Maricopa	18	47	1,993
Pima	1	1	80
Pinal	11	51	2,572
Santa Cruz	<u>1</u>	<u>1</u>	<u>16</u>
Totals	31	100	4,661
Eastern Area			
Cochise	5	10	661
Gila	1	1	23
Graham	11	64	2,308
Greenlee	<u>2</u>	<u>3</u>	<u>42</u>
Totals	19	78	3,034
GRAND TOTALS	50	178	7,695

Table submitted in February 1960,
by Arizona Cooperative Survey

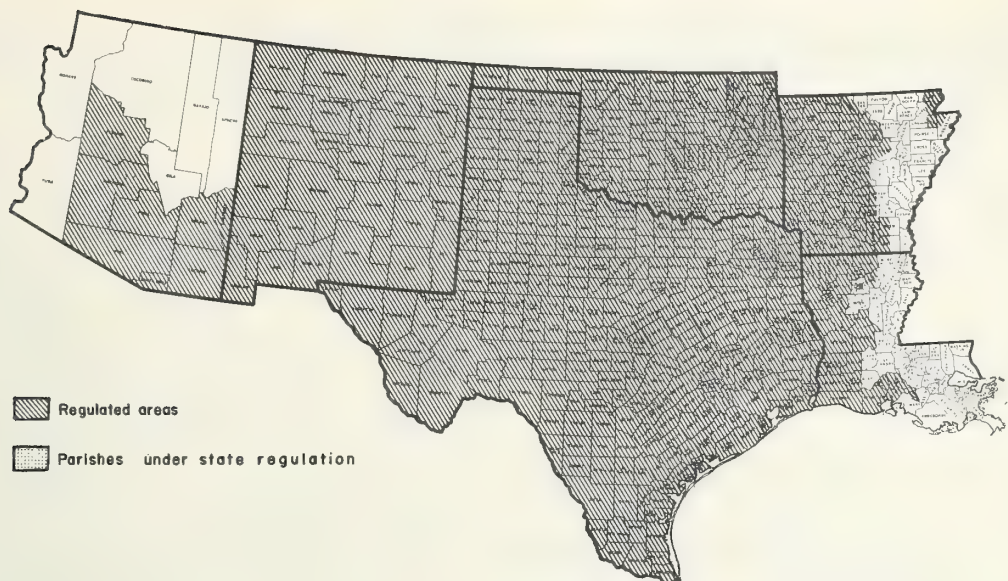
Pink bollworm larvae were found during the fall in Caddo, Clairborne, De Soto, Lincoln, Natchitoches, Rapides, Sabine and Union Parishes, Louisiana, and 12 larvae were recovered in Arkansas in 1959, compared with 319 in 1958 and 2 in 1957. The 1959 survey in Arkansas was the most extensive survey of gin trash of any year since the pest was first found in the State. No larvae were recovered in the delta section, whereas larvae were recovered in 4 delta counties in 1959. A total of 47,983 bushels of gin trash was collected and examined in Arkansas compared with 32,297 bushels and 24,537 bushels in 1958 and 1957, respectively.

Pink bollworm larvae were collected in hibiscus blooms at Plantation Yacht Harbor, Monroe County, Florida. Insecticidal treatments were immediately put into effect. Surveys during 1959 in Nevada were negative.

A pink bollworm map showing the areas under regulation as of January 1, 1960, is shown on the following page.

PINK BOLLWORM REGULATED AREAS

JANUARY 1, 1960



COTTON LEAFWORM (*Alabama argillacea*) did not appear, as usual, in most of the cotton-growing areas until late in the season. Most infestations were light or noneconomic, but the pest did cause considerable "ragging" of cotton leaves at St. Landry and Acadia Parishes, Louisiana, during September. Infestations in Texas were noted only in local areas and light infestations were reported in widely scattered areas of Oklahoma, with only the Payne-Pawnee County area reporting marked defoliation due to this species.

Cotton leafworm infestations in New Mexico were minor and light infestations occurred in some fields in southeastern Arizona in late August and September. Infestations in Missouri were not a problem and they were noneconomic in Arkansas even though cotton leafworm was common in some areas of that State in October. The first cotton leafworm moth was taken on July 13 in Arkansas. The pest first appeared in southwestern Georgia in early August and then moved north and east to the vicinity of Cordele, Crisp County.

CABBAGE LOOPER (*Trichoplusia ni*) infestations were light to moderate in Georgia and New Mexico, present in Arizona, caused damage to a few Oklahoma cotton fields, and were less numerous than in 1958 in Arkansas. Infestations in Texas were generally light but there were several isolated heavy infestations. Infestations in Arizona were held down by a disease.

YELLOW-STRIPED ARMYWORM (*Prodenia ornithogalli*) damaged seedling cotton locally, in Louisiana, but was severe enough to require treatments and EUROPEAN CORN BORER (*Pyrausta nubilalis*) populations were lower than during the past several years in Missouri, with only an occasional cotton plant being damaged.

BEET ARMYWORM (Spodoptera exigua)* was generally light or absent in Arizona during the young stages of cotton growth in the spring. A few areas in the central part of the State had medium infestations. Heavy damage was caused by this pest in some areas of Maricopa and Pinal Counties during July and August, however. Larvae stripped the plants of squares and small bolls as well as foliage.

Some central and southwestern areas of Arizona became heavily infested with COTTON LEAF PERFORATOR (Bucculatrix thurberiella) between mid and late August. Plantings on poorer soils were infested first and heaviest, being almost completely defoliated in most cases. Infestations declined rapidly during early October.

The first appearance of the characteristic "flag leaf", caused by SALT-MARSH CATERPILLAR (Estigmene acrea), was noted in the central and southwestern areas of Arizona in late August. Infestation buildups of this species were gradual in Arizona but became heavy by mid-September, with considerable migration between fields. Defoliation was heavy in most areas of Arizona but it was considered too late to affect the yield of cotton. Compared with conditions in Arizona, only one small infestation was reported in New Mexico, that being in a field near Roswell, Chaves County.

COTTON SQUARE BORER (Strymon melinus) caused much concern throughout Texas and occasional larvae were found on cotton in Eddy, Lea, Dona Ana, Otero, Chaves and Luna Counties, New Mexico. This pest was not a problem during 1959 in Missouri.

In Missouri, heavy infestations of CUTWORMS, mainly VARIEGATED CUTWORM (Peridroma margaritosa), in alfalfa, red clover and pastures began to migrate to cotton during late May. The migrating larvae caused light to heavy damage to the marginal rows of cotton in nearly all fields that bordered a host legume. STALK BORER (Papaipema nebris) was also a pest in Missouri, being present in a few widely scattered fields, mainly in southern Dunklin County, and causing light injury to marginal rows of cotton (2-3 percent).

GARDEN WEBWORM (Loxostege similalis) damaged seedling cotton locally, in Louisiana, but was severe enough to require treatments. This species was not a problem in Missouri during 1959.

A LEAF ROLLER (Platynota stultana) was rather common on cotton in Arkansas during the early part of the season but was not of economic importance. Light infestations were present in cotton throughout the summer in Arizona, however.

LYGUS BUGS (Lygus spp.) were a major problem of cotton in Arizona, New Mexico and Nevada during 1959. In Arizona, infestations began increasing as cotton began to square heavily in early June. Fields located near alfalfa were hit first, especially where alfalfa was cut. Counts averaged 15 to 40 per 100 sweeps in untreated fields through July, August and early September. Average counts in Arizona were highest and damage heaviest during mid and late summer, especially during the period when water was kept off alfalfa. Infestations of lygus bugs caused considerable drop of young squares and bolls in cotton fields of southern New Mexico and numbers were light to heavy beginning in July in Nevada, with most fields requiring several treatments to reduce populations.

TARNISHED PLANT BUG (L. lineolaris) infestations required control in the delta of Mississippi during June and early July. This species was considered the number one pest of cotton in that area of the State at that time. However, infestations were generally light in Louisiana. Another lygus bug (L. neglectus) was collected on cotton in one Arkansas county in 1959; the first record of this species on cotton in the State.

*Zimmerman, E. C., 1958, Insects of Hawaii, Vol. 7:339.

Infestations of COTTON FLEAHOPPER (Psallus seriatus) were of much concern again during 1959 in Texas. Damage was heavy in local areas of Texas and feeding by this species caused losses in many cotton fields in Luna, Dona Ana, Hidalgo, Eddy, Chaves and Otero Counties, New Mexico. Infestations were generally light in Oklahoma and Arizona, but in the latter continued longer into the summer than did Spanogonicus albofasciatus. Cotton fleahopper and other plant bugs were of minor importance in Arkansas.

Infestations of a FLEAHOPPER (Spanogonicus albofasciatus) increased to heavy numbers in cotton in Arizona during early May before squaring began. Counts of 20 to 40 per 100 sweeps continued through June but began to decrease in early July. Counts in Yuma County, Arizona, were lower than in the central and southeastern areas. Small numbers were found in Nevada throughout the season. This species was officially recorded in Nevada for the first time during 1959.

A PLANT BUG (Neurocolpus nubilis) was observed in cotton in all twenty-one counties surveyed in Arkansas and a FALSE CHINCH BUG (Nysius raphanus) damaged one cotton field near Las Cruces, Dona Ana County, New Mexico, where 40 to 50 nymphs per cotton seedling were common.

THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) was observed feeding on cotton in Irwin County, Georgia, and BROWN STINK BUG (Euschistus servus) was light to medium on cotton in some areas of Arizona where it caused some damage to squares and small bolls.

LEAFHOPPERS caused considerable alarm to growers in Missouri during the latter half of July when Oncometopia undata and other species were found in moderate numbers, one to two per plant, in cotton fields in the northern cotton-growing counties. Economic damage could not be detected and controls were not necessary.

A WHITEFLY (Trialeurodes abutilonea) was light to medium in some central areas of Arizona during late April and May and whiteflies were fewer than in 1958 in Arkansas.

COTTON APHID (Aphis gossypii) was a problem in areas of Georgia, Texas and Nevada. Populations were light to moderate in Georgia, with some fields requiring controls, and seedling cotton required treatment during May in Nye County, Nevada. Populations in Texas built up during the season, with heavy infestations reported on the south plains. Infestations in Oklahoma were generally light, with some heavy populations being reported in several fields in the southwest during July, and populations were very low in Arkansas and light in Louisiana. Cotton aphid was not a problem in Missouri. COWPEA APHID (Aphis medicaginis) infestations were spotty and light to moderate in Dona Ana, Luna and Hidalgo Counties, New Mexico.

THRIPS were a problem in young cotton in several states during 1959. Infestations were generally heavy in May in northern Louisiana, light in the central area of Louisiana and generally light in Arkansas. However, during mid-June in Missouri, a heavy migration of thrips from small grain fields occurred and late-planted cotton fields, as well as spots in retarded fields, were heavily damaged to the point of loss of all leaves. Some treatments were applied, but even the untreated fields had completely recovered by early July and no apparent loss of cotton yield was evident.

Infestations of Frankliniella spp. were generally light in Oklahoma and variable in Texas, with heavy populations being recorded in the north central and central areas of that State. Frankliniella spp. caused less damage and required less control than in 1958 in Nevada.

Thrips infestations in Arizona were light, generally, on seedling cotton in all areas and damage was not significant in most cases. Infestations did build up in a few isolated areas of the State but this occurred after the cotton had reached at least the four-leaf stage and damage was not severe. In New Mexico, many growers applied early season controls to rid cotton of heavy infestations.

SPIDER MITES caused damage to cotton in several states during 1959. The area of greatest concern appeared to be Missouri. Here the spider mite outbreak, mainly STRAWBERRY SPIDER MITE (Tetranychus atlanticus), ranked second only to that of 1956 in that State and would have surpassed 1956 had it not been for the prompt, repeated and wise use of the newer, recommended miticides. Damaging spider mite populations were also recorded in Nevada, where the highest populations yet encountered were recorded in Nye County. Over ten times as many acres were treated as in 1958 in that county. The mite problem in Missouri began in May when cotton was in the four-to-six-leaf stage and grew steadily worse until early in mid-August. At the height of the problem, approximately two-thirds of the scouted fields had infestations requiring controls. Generally speaking, however, premature defoliation and loss of lint quality was held at a minimum through the widespread use of miticides.

Spider mite populations were generally light in Louisiana, Texas, New Mexico and Arizona while a few light to medium infestations were recorded in the central and southwestern areas of Arizona during the summer and fall. T. cinnabarinus was the primary species recorded in Arizona.

Spider mite infestations in Arkansas were more common in July than at the same time in 1958. Infestations in August in that State were comparable for 1958 and 1959, while late infestations in late August and September were somewhat lower in 1959 than in 1958. Infestations, as usual, were more common in the north-eastern area than in other areas of Arkansas; however, mites were more common in the southern area than in most years. T. atlanticus, T. lobosus and T. schoenel were the species reported in Arkansas.

Infestations of TWO-SPOTTED SPIDER MITE (T. telarius) were mostly moderate in Georgia, but ranged from light to heavy, while infestations of DESERT SPIDER MITE (T. desertorum) were light to heavy, with most being moderate, in Georgia.

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